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there is no teaching in the art of the straightening device being attached to a grinding headstock and the Office Action does not address the feature.

CLAIM REJECTIONS UNDER 35 U.S.C. § 102(b)

Claim 68 is rejected under 35 U.S.C. § 102(b) as being anticipated by the Colonius reference. Applicant herein respectfully traverses this rejection. "Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*" *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added). It is respectfully submitted that the cited reference is deficient with regard to the following reasons.

The Examiner cites col. 1, lines 31-69 of the Colonius reference for teaching the claimed invention. The reference recites deflection of a shaft to a point equal or greater than the plastic yield point of the straight part. However, the machine shown in the Colonius invention is a device specially constructed for bending or deflecting brittle and hard materials as related in the Background section of the reference. More particularly, the reference relates to the strengthening of a common camshaft which would present the characteristics noted in the Background section of the reference. Col. 1, line 74 to col. 2 line 20.

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Hence, the reference does not relate to “an assembled camshaft which comprises a steel tube and includes a bend to be eliminated by straightening.”

It will further be noted that the reference is deficient in so far as an anticipation rejection requires each element of the claimed invention to be present in the reference as claimed. Ignoring the fact that the reference does not relate a method to be used on *assembled* camshafts, as opposed to the traditional cast shaft related in the Colonius reference, the reference is also deficient in that it does not teach grinding the camshaft on a grinder *and* also straightening the camshaft on the *grinder*. The Colonius reference presumes that a finished camshaft is to be straightened and in no way suggests that grinding may be accomplished on the straightening machine of Colonius. As related below, the Colonius machine is a far cry from an arrangement which would be used in a cylindrical grinding apparatus both in terms of the massive ram used to effect bending of standard camshafts and the need for resiliently load rollers placed along shaft and require air cylinders. Col. 2, lines 61-70.

In view of the above, it is respectfully submitted that claim 68 particularly describes and distinctly claims elements not disclosed in the cited reference. Claim 68 requires that both grinding and straightening be conducted on the grinding machine and that the procedures be carried out on an *assembled* camshaft.

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Therefore, reconsideration of the rejections of claim 68 and its allowance are respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §103(a)

Claims 69, 72-76 and 82 are rejected under 35 U.S.C. §103(a) as obvious over the Junker '043 reference in view of the Colonius reference. Claims 77 and 78 are rejected under 35 U.S.C. §103(a) as obvious over the Junker '043 reference in view of the Colonius reference. Claims 89-93 are rejected under 35 U.S.C. §103(a) as obvious over the Junker '043 reference in view of the Colonius reference and further in view of the Armstrong reference. The Junker reference is cited for teaching a grinding machine apparatus and process. However, the Junker device is a device which is dedicated to grinding alone and does not envision nor enable straightening to be carried out. In order to fill this void in teaching, the Examiner relies on the Colonius reference.

The Junker reference is directed to the grinding of crankshafts while the present invention is directed to camshafts which are assembled camshafts, i.e., cam bodies are disposed onto a steel pipes and then machined. The Junker reference is primarily directed to the grinding of crankshafts having concentricity maintained to tolerances in the amount of 0.01 mm and less. Col. 3, line 67 to col. 4, line 9. The invention in Junker recognizes that stresses released during the machining of

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the main journals, which result in distortion of the part, can be eliminated in successive grinding operations made possible by the Junker device. Col. 5, lines 29 through 46. Hence, the focus of the Junker reference is provide a finished ground part which is maintained to exacting concentricity requirements by means of releasing and relieving stress during the grinding procedure made possible by the Junker device. Thus, the final part produced by the Junker device would not require the straightening which is the object of the present method claims and the apparatus claimed. Thus, it is respectfully submitted to the Examiner that one skilled in the art would fully appreciate the accuracy achieved by the Junker device, e.g., 0.01 mm, and would have no reason to incorporate a straightening device into the Junker reference because the parts produced by the Junker reference do not require straightening.

It will further be noted that one skilled in the art would not consider a grinding apparatus such as set forth in the Junker device as being susceptible to incorporation of a straightening device such as disclosed in the Colonius reference. The grinding machine of the Junker invention is directed to precisely controlled grinding so as to produce finished parts which meet exacting tolerance requirements *when removed from the Junker set up*. Col. 6, lines 49-53. Thus, the crankshaft is held by a chuck and a tailstock "such that its center axis 13 is exactly in alignment with the center axes of the work spindle 3 and the tailstock quill 8."

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Col. 5, lines 16-19. The Junker reference even further mentions that the crankshaft “may be clamped under slight pressure, in a pressureless manner or even under axial tension” and is “driven by the work spindle 3 with the chuck 2 to rotate concentrically about a main journal 11.” It is thus imperative that the crankshaft be precisely supported.

In contrast to the *grinding machine* of the Junker reference, the Colonius reference informs those skilled in the art that the support devices used are specifically chosen for supporting a cam shaft under great loading. For example, rollers are used at each end to support the camshaft and a chuck is used that “is free to accommodate changes in the deflection angle of the longitudinal axis of the part at that end.” Col. 1, lines 36-39. Indeed, even a flexible coupling 28 is used to drive the chuck so as to accommodate deflection. Furthermore, bearings 36 and 38 of the Colonius reference are specially designed to accommodate spindle deflection. This sort of set up is not one a person skilled in the art would use to precisely support a crankshaft to be finished ground as is related in the Junker reference. Allowing deflection in the shaft of the crankshaft in the Junker reference would certainly interfere with the tolerances sought to be maintained by the device of the Junker reference.

As noted above, the Junker reference discusses holding the workpiece under *slight* pressure, no pressure, or tension. This results in fewer internal stress in the

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part being machined. In contrast, the Colonius device holds a part to be acted on by a ram 14 driven by a hydraulic 15. Since the Colonius reference does not relate to assembled camshafts, but instead traditional cast parts, tremendous force is necessary to deform the parts in question. This is evidenced by the massive machine frame 11 and over head member 12 used to support the hydraulic ram. Indeed, such forces are applied to the part by the roller 19 from above, that it is necessary to support the part from below using rollers 22 and air cylinders 24. This arrangement taught by the Colonius reference, massive hydraulic rams and counter support rollers, the use of which requires bearings and chucking arrangements to allow for spindle and chuck deflection, is not one that an engineer skilled in the art would be inclined to incorporate into the precision grinding device of the Junker reference.

It is respectfully requested that the Examiner give serious consideration to the points noted above so as to view the references with the same considerations as one of ordinary skill in the art of grinding machine design with appreciation of all factors presented, especially that the Colonius reference is not a grinder and does not anticipate straightening of assembled camshafts to which the present invention is directed. It is the operations on the assemble camshafts which differentiates the present invention from the Colonius device. Instead of straightening a solid cast part as in the Colonius disclosure, the present invention

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is straightening an assembled part wherein the yield strength of the steel pipe governs and not a solid cast portion. Thus, the massive structure of the Colonius device is not needed. However, it is only the present disclosure of the invention which provides such intuition as both the Junker reference and the Colonius reference are silent in this regard.

Claims 75 and 82 each recite that the straightening device is mounted on the grinding headstock. This configuration is nowhere related in the applied references and is not addressed in the Office Action. Hence, it is respectfully submitted that a *prima facie* case of obviousness is not established with regard to these claims because the feature of the straightening device being mounted on the grinding headstock is not addressed in the Office Action not taught by the applied references. As noted above, the Colonius reference employs a massive hydraulic ram arrangement to effect straightening with the ram being supported on a correspondingly massive machine frame 11. This in no way suggests mounting a straightening device on a grinding headstock. It is the recognition of the present inventor of assembled camshafts straightening requirements which makes it possible to mount a straightening device on the grinding headstock and not a massive support frame.

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Thus, it is respectfully submitted that the rejected claims are not obvious in view of the cited references for the reasons stated above. Reconsideration of the rejections of the claims and their allowance are respectfully requested.

REQUEST FOR EXTENSION OF TIME

Applicant respectfully requests a one month extension of time for responding to the Office Action. The fee of \$130 for the extension is provided for in the charge authorization presented in the PTO Form 2038, Credit Card Payment form, provided herewith.

If there is any discrepancy between the fee(s) due and the fee payment authorized in the Credit Card Payment Form PTO-2038 or the Form PTO-2038 is missing or fee payment via the Form PTO-2038 cannot be processed, the USPTO is hereby authorized to charge any fee(s) or fee(s) deficiency or credit any excess payment to Deposit Account No. 10-1250.

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In light of the foregoing, the application is now believed to be in proper form for allowance of all claims and notice to that effect is earnestly solicited.

Respectfully submitted,
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